

DOCUMENT RESUME

ED 159 377

CE 017 313

AUTHOR Campbell, Clifton F.
TITLE Vocational Training: Maximizing Individualization with Instructional Packages.
PUB DATE [77]
NOTE 16p.; Photographs in this document may not reproduce well
EDRS PRICE MF-\$0.83 Plus Postage. HC Not Available from EDRS.
DESCRIPTORS Behavioral Objectives; Criterion Referenced Tests; Delivery Systems; *Individualized Instruction; *Learning Modules; Media Selection; *Vocational Education

ABSTRACT

Instructional packages (PAKs) are effective in promoting vocational learning as they provide an organized procedure for delivering self-paced instruction to individual trainees on a personalized basis. Some of the advantages of PAKs are that they free an instructor from the role of full-time transmitter of skills and knowledge, reduce equipment needs, and assure that each trainee is exposed to a uniform training program. Based on pre-determined job tasks and performance requirements, each PAK is made up of four fundamental components: (1) the introduction, which gives an overview of the PAK, the terminal performance objectives, and the procedure for using the PAK; (2) a pre-check which is designed to determine the extent of trainee competency prior to PAK exposure (the results can be used to diagnose and prescribe which instructional modules a trainee needs); (3) printed modules of instruction (the bulk of the package) which contain an enabling objective, a training activity, resource, and feedback; and (4) the criterion referenced measure or posttest, which assesses the trainee's achievement of the terminal objective. While some trainees are proficient with printed materials, others require different types of media, such as audio and video cassette tapes, sound filmstrip, and sound slide programs. Emphases should be placed on those forms of media which are accepted by trainees and can be produced within a reasonable amount of time with available equipment. PAKs and media should be developmentally tested (individual product tryouts, small group tryouts, and field tested) against criterion referenced measures before being implemented. Observations of the products in use and data collected during each program offering should be utilized to continually improve the reliability of PAKs and media. (JH)

* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY.

PERMISSION TO REPRODUCE THIS MATERIAL IN MICROFICHE ONLY HAS BEEN GRANTED BY

Clifton P. Campbell

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC) AND USERS OF THE ERIC SYSTEM.

VOCATIONAL TRAINING: MAXIMIZING INDIVIDUALIZATION WITH INSTRUCTIONAL PACKAGES

Prepared by: Clifton P. Campbell

Under typical workshop conditions it is neither feasible nor desirable to keep all trainees in a course progressing at the same pace or working on the same activity. For one thing, the availability of equipment usually limits the number of trainees who can be involved in a given activity at any one time. Experienced instructors know that it is also highly unlikely for the individuals which make up a training course to be alike in the rate at which they work, their interests, their style of learning or capacity to learn. (The Center for Vocational Education, 1977, p. 3)

Training methods which require all participants to be working at the same pace on an identical activity are typically directed toward the "average learner", and may miss almost entirely the ambitious and/or the slow. Neither accelerated nor slow learners are stimulated by this type of situation. Some trainees are bored by the slow pace while others lag behind, discouraged by a rate too fast for them, and a few may even drop-out completely. A viable alternate, which addresses the problems of the lock-step group-paced training approach, is individualized instruction.

Individualizing Vocational Training

While there are various means of individualizing vocational training, the instructional package (PAK) which is competency

ED159377

CE 017 313

based rather than time-based, is one of the more enlightened and useful. Instructional packages are effective in promoting learning. They provide an organized procedure for delivering self-paced instruction to individual trainees on a personalized basis.

One of the advantages of the instructional package which makes its selection for use appropriate is that it carries much of the load of supervising training experiences. Instructional packages can free an instructor from the role of a full-time transmitter of skills and knowledge for other important duties such as evaluating, counseling, enrichment and individual tutoring as the need arises. (USAF School, 1974, p. 7-66) See Figure 1.

The use of instructional packages can also reduce equipment needs and increase faculty utilization. This is possible because various trainees in a course will be working on a different activity at a particular time.

Furthermore, pre-packaged instructional materials assure that each trainee is exposed to a uniform training program, based on pre-determined job tasks and performance requirements derived from various forms of job and task analysis.¹ This logical method results in graduates with consistent and predictable skills.

Additional advantages of using instructional packages include:

- PAK's are portable, easy to handle, and require no special equipment to operate. They are readily accessible and may be re-read and reviewed as often as necessary.

¹Although the identification of job tasks, performance objectives and requirements is a major undertaking, the purpose of this paper is to describe the delivery of instruction through PAK's therefore no discussion of training program content is included.

- PAK's present skills and essential knowledge in an organized and logical fashion.
- Trainees may advance at their own pace, independent of others enrolled in the same course.
- Cognitive and psychomotor performance objectives are clearly stated in behavioral terms.
- Illustrations show the trainees the key points, tools and equipment. They allow for detailed study of manipulative processes and serve as a guide for hands-on activities.

All these and others advantages are cited in the literature on instructional packages.

Instructional Packages

Instructional packages are useful in directing trainees with a wide variety of individual needs and interests, through sequential training activities and corresponding resources which enable them to meet performance objectives. Such instructional packages can take different forms. The form used by the Saudi Arabian Ministry of Labor and Social Affairs, Vocational Training Directorate has been standardized and is presented in an illustrated, printed, consumable booklet format. This format was developed after a number of other approaches were considered and discarded.

These criterion referenced, developmentally tested instructional packages are not modified text, reference, or workbooks, nor are they programmed learning texts. However, they do contain many of the advantages inherent with each. Instructional packages are a carefully designed and sequenced method of delivering self-

paced instruction in printed form to individual trainees.

Instructional packages can be bound in durable cover stock and may have drilled holes for optional insertion in a three-ring binder. Sheets in the PAK can be embellished with a thin border and identified as to their purpose by a distinctive logo with a title. Color can be introduced for effect, organization, and to give additional emphasis to basic and/or key points. This is accomplished by using different colors of paper stock or by pre-printing the border and/or logo with various color inks.

Each instructional package is made up of four fundamental components: 1) the introductions, 2) a pre-check, 3) instructional modules, and 4) a post-check. The first component, the Introductions, consists of a) an introduction to the PAK, b) the terminal performance objective, and c) the procedure for using the PAK. These three items, together with the title of the instructional package, a numeric code and other information as necessary, are presented on the first sheet. The numeric code specifies the trade, unit, PAK, and page number. See Figure 2.

A trainee begins the PAK by reading the introduction which contains a brief overview of the information contained within. It also provides a concise motivational comment explaining the relevance and importance of what is about to be learned. In a short and clear statement, it tells trainees the reason(s) why it is important to learn this material.

In order to avoid creating barriers between trainees and the instructional package, the introduction ought to provide some assurance that they will be successful as a result of this

experience. It should indicate that by putting forth a reasonable effort they will learn. In short, there must be some interest and motivation to turn the page and read on.

The terminal performance objective (TPO) is the reason the PAK exists. It is an objective, stated in behavioral terms that trainees can understand. The terminal performance objective tells trainees what they must be able to do, the conditions under which they will perform and the minimum or expected level of performance. Specifications stated in the terminal performance objective are used to develop the criterion referenced measures incorporated in the pre- and post-checks. The PAK introduction and the terminal performance objective can also be effectively combined in a single expressive narrative.

The procedure should provide whatever instructions are necessary to facilitate using the PAK. This might include a safety message and directions on when to consult with the instructor. However, on occasion, instructions may be unnecessary, and in those instances they need not be included.

The procedure can also include a table of contents type listing of all instructional modules which make up the PAK. This list of modules may also serve as a learning guide where the results of the pre-check can be recorded. These results provide a trainee profile which indicates the modules to be studied and those where competency has been demonstrated. Figure 2 shows the learning guide at the bottom of the introduction sheet.

The second component of an instructional package is a pre-check, or pre-test, with an answer key. It is designed to determine

the extent of trainee competency prior to PAK exposure. The pre-check will ascertain which of the enabling objectives, if any, the trainee has already mastered through another learning situation, reading, or work experience. This is accomplished by using all or a sampling of criterion referenced test items and/or activities for each module in the PAK.

The results of the pre-check can be used to diagnose and prescribe which instructional modules a trainee needs to complete. Trainees need only complete those modules within a PAK which present skills and/or knowledge they do not already possess. This provides for bypassing the entire PAK or entering it at various points.

When trainees feel that their exposure to the content of a PAK is limited, they may omit the pre-check and begin with the first instructional module. They may also elect to simply review the pre-check to gain a sense of what learning is about to take place.

The third component, which comprises the bulk of an instructional package, consists of a number of generously illustrated printed modules of instruction. A module is described by Mager (1977, p. 2) as a combination of the instructions, content, and activities which facilitate the development of a desired competence. Some self-contained modules present essential knowledge, some provide hands-on practice experience to gain skills, while others integrate the knowledge, skills, and attitudes required to perform a job task.

Modules of about six to twelve pages in length are designed to focus upon a specific job task and performance objective. They are contrived to direct a trainee through sequential training activities and corresponding resources. These relevant training activities and learning resources facilitate the development of competence in performing the desired job task. Modules are titled, numbered and sequenced within a PAK from the simple to complex, the concrete to the abstract, or in some other logical way so as to build progressively knowledge and skills which will enable the trainee to attain the terminal performance objective.

Each instructional module is made up of: a) an enabling or sub-objective, b) a training activity(s), c) resources, and d) feedback. The first part of the module consists of the enabling or sub-objective and on occasion an optional introduction to the module. When used, the introduction is prepared according to the same guidelines presented for the introduction to the PAK.

The enabling objective is a pre-requisite through which a trainee progresses in order to achieve the terminal performance objective of the PAK. Each enabling objective is written for the target group in behavioral terms according to criteria previously discussed for a terminal performance objective. When accomplished, the enabling objective will equip the trainee with the competence needed for the performance of a job task.

The next part of the instructional module is the training or learning activity(s). This experience provides for the application of a skill or knowledge derived from the resources furnished. Each activity must be consistent with the behavior stated in the enabling objective so that after completing the experience a trainee

is able to achieve the desired performance. The sequential training activity frequently includes check-points where trainees self-check their step-by-step progress or seek instructor assistance prior to consulting the feedback sheet.

Many of the required resource sheets may be prepared from readily available materials. Sources for non-copyright materials include business and industrial enterprises, curriculum centers, government agencies, and colleagues. Periodicals and reference books are also excellent resources; however, familiarization with the revised copyright law (of 1976) is recommended.

Other resource materials can be developed by the instructor. For maximum effectiveness in attaining the enabling objective, resource sheets ought to be written in a brief no-nonsense style. They should also utilize numerous easy-to-follow illustrations, charts, plans, and other graphics which help explain or make things clear. See Figure 3. Examples, analogies, underlining, setting important points off in boxes, and the like can help to emphasize information.

Feedback is the last part of each instructional module. It is intended to keep the trainees informed of their personal progress and identify areas of weakness. Feedback enables trainees to obtain some type of information concerning the correctness of their responses to the training activity prior to undertaking the post-check. Types of feedback depend on the kind of training activity and range from examples of acceptable exercises to answers for multiple-choice questions.

The feedback experience will be used by trainees individually as a method of self-checking their achievement of the enabling objective. When trainees have not reached the acceptable proficiency level, they may recycle through the module in order to assure success in the post-check. This procedure is suggested in implementing individualized training; otherwise, every trainee would require instructor input for each enabling objective. When trainees have successfully completed all the feedback experiences they are ready to undertake the post-check.

The fourth, and final, component of an instructional package is a criterion referenced measure -- post-check or post-test. The post-check, which is similar to the pre-check in what it measures, will be used to assess a trainee's achievement of the terminal performance objective following PAK completion. Post-checks may range from multiple-choice instruments which measure the achievement of knowledge, to checklists used in evaluating exercises completed by trainees. When trainees successfully complete the post-check, they proceed to the next unmastered instructional package.

However, when trainees do not achieve the minimum level of competency required to meet the terminal performance objective, they arrange with their instructor to: 1) complete modules previously bypassed, 2) repeat training activities, 3) review supplementary resources, 4) complete additional activities, or perform some other related activity before repeating the post-check. (The Center for Vocational Education, 1977) Competency is assured because the instructor directs the trainee into meaningful activities that eventually lead to mastery of the objective.

Instructional packages and their component modules are delivered in a manner which allows utilization by individual or small groups of trainees. Individual use does not mean that a trainee sits in front of a box (carrel) working on a PAK in isolation. The instructional package is designed for use under the direction and with the assistance of an instructor.

PAK's can be used to support an instructor demonstration in which all steps are explained and shown and the finished product can be seen. The instructor demonstration, a proven training method which functions well, provides the big picture so that trainees can proceed step-by-step according to the instructions provided by the PAK. (USAF School, 1974, p. 7-66)

Instructional Media

While some trainees are proficient with and will use illustrated printed materials effectively others require or choose media. It is therefore important to attend to these various learning styles by identifying or developing instructional media. Various types of media such as audio and video cassette tapes, sound filmstrips and sound slide programs can effectively augment printed materials.

The availability of printed instructional packages enriched by appropriate media will provide a range of training options for attaining each enabling objective. This should contribute to increased motivation and heightened interest, thereby promoting learning.

Emphasis should be placed on those forms of media which are accepted by trainees and can be produced within a reasonable amount

of time with available equipment. A viable approach is to move from relatively simple mediation to the more complex, making every effort to maintain continuity and avoid duplication of effort. Both media and the printed materials it augments should be refined to a literacy level which accommodates variations in the backgrounds and educational experiences of trainees.

Standardization

The degree of success that is achieved with instructional packages and media is largely dependent on the thoroughness of the design, planning, development, and editing that precede each finished product. Nevertheless, PAK's and media should be developmentally tested against criterion referenced measures before being implemented. This is done to discover flaws and to determine the validity of content and sequence in terms of trainee achievement.

An evaluation of procedures for using instructional packages and media should also be conducted. This is necessary because the longer it takes a trainee to decipher directions, the less time and effort is spent on actual learning. Thus developmental testing includes an evaluation of the instructions, as well as the instruction.

A sound developmental testing plan includes individual product tryouts, small group, and operational or field testing. Each instructional package or mediated component is validated when testing gives enough consistent results to establish with confidence that it will do what was intended when used under appropriate conditions for the target population. (Campbell, 1977, p. 51)

To be effective in promoting learning instructional packages and media must be accepted by the trainees. If the trainees do not react favorably the materials are of limited value, regardless of how scientifically correct or educationally sound they might be. Therefore, the testing plan should include an analysis of trainee attitudes toward the materials, as well as their test performance. After all necessary revisions are made and the products are judged valid and useful, the training program is ready for implementation and general dissemination.

Observations of the products in use and data collected during each program offering should be utilized to continually improve the reliability of PAK's and media. Feedback from follow-up surveys on the performance of graduates at the workplace, along with labor market information, and recommendations from craft advisory committees, can also be used to improve the training program. This feedback process exists to modify and up-date instructional materials when inconsistencies are discovered between the training program and the needs of the job.

Summary

Individualized instruction is a viable alternate to lock-step, group-paced training. It offers numerous advantages for the trainee, instructor, and the institution. Criterion referenced, developmentally tested instructional packages are a carefully designed and sequenced method of delivering self-paced instruction to individual trainees. PAK's are devised, with help from the instructor, to do a complete training job.

REFERENCES

Campbell, Clifton P. Consider Sound Slide Teaching.

Technological Horizons in Education Journal, 1977,

4 (7), 38-39 & 51.

Mager, Robert F. Instructional Module Development.

0-1 The Development Process. Los Altos Hills, California:

Mager Associates, 1977.

The Center for Vocational Education, the Ohio State University.

Direct Student Laboratory Experience. Module C-7 of

Category C - Instructional Execution, Professional Teacher

Education Module Series. Athens, Georgia: American

Association for Vocational Instructional Materials, 1977.

USAF School of Applied Aerospace Sciences, Department of Recruiting

and Instructor Training. Student Print Material for the U.S.

Air Force Course System, Instructional System Materials

Development. Blocks II and III. Washington, D. C.: National

Laboratory for the Advancement of Education, 1974.

**DEVELOPING INSTRUCTIONAL PACKAGES
FOR VOCATIONAL TRAINING**

Date: _____

1. PURPOSE

The purpose of this manual is to provide a guide for developing instructional packages for vocational training. The manual is designed to be used by those who are responsible for the development of instructional materials for vocational training.

2. SCOPE

This manual covers the development of instructional packages for vocational training. It includes information on the selection of content, the development of objectives, the development of instructional materials, and the evaluation of the instructional package.

3. REFERENCES

1. *Instructional Materials Development*, by [Name], [Publisher], [Year].

2. *Instructional Materials Development*, by [Name], [Publisher], [Year].

3. *Instructional Materials Development*, by [Name], [Publisher], [Year].

4. DEFINITIONS

Instructional Package: A collection of instructional materials that are used to deliver instruction to a learner.

Instructional Materials: Any material that is used to deliver instruction to a learner.

Instructional Objectives: Statements that describe the knowledge, skills, and attitudes that a learner should have after completing the instructional package.

Instructional Materials Development: The process of developing instructional materials for a specific instructional package.

5. PROCEDURE

5.1. Selection of Content

The first step in the development of an instructional package is the selection of content. The content should be selected based on the following criteria:

- The content should be relevant to the vocational training program.
- The content should be up-to-date and accurate.
- The content should be presented in a clear and concise manner.
- The content should be presented in a logical sequence.

5.2. Development of Objectives

The second step in the development of an instructional package is the development of objectives. The objectives should be developed based on the following criteria:

- The objectives should be specific and measurable.
- The objectives should be achievable.
- The objectives should be relevant to the vocational training program.
- The objectives should be presented in a clear and concise manner.

5.3. Development of Instructional Materials

The third step in the development of an instructional package is the development of instructional materials. The instructional materials should be developed based on the following criteria:

- The instructional materials should be relevant to the instructional objectives.
- The instructional materials should be up-to-date and accurate.
- The instructional materials should be presented in a clear and concise manner.
- The instructional materials should be presented in a logical sequence.

5.4. Evaluation of the Instructional Package

The fourth step in the development of an instructional package is the evaluation of the instructional package. The evaluation should be based on the following criteria:

- The instructional package should be evaluated for its effectiveness in achieving the instructional objectives.
- The instructional package should be evaluated for its relevance to the vocational training program.
- The instructional package should be evaluated for its up-to-date and accurate content.
- The instructional package should be evaluated for its clear and concise presentation.
- The instructional package should be evaluated for its logical sequence.

6. APPENDICES

6.1. Appendix A: Sample Instructional Package

6.2. Appendix B: Sample Instructional Objectives

6.3. Appendix C: Sample Instructional Materials

6.4. Appendix D: Sample Evaluation Form

7. REFERENCES

1. *Instructional Materials Development*, by [Name], [Publisher], [Year].

2. *Instructional Materials Development*, by [Name], [Publisher], [Year].

3. *Instructional Materials Development*, by [Name], [Publisher], [Year].

15

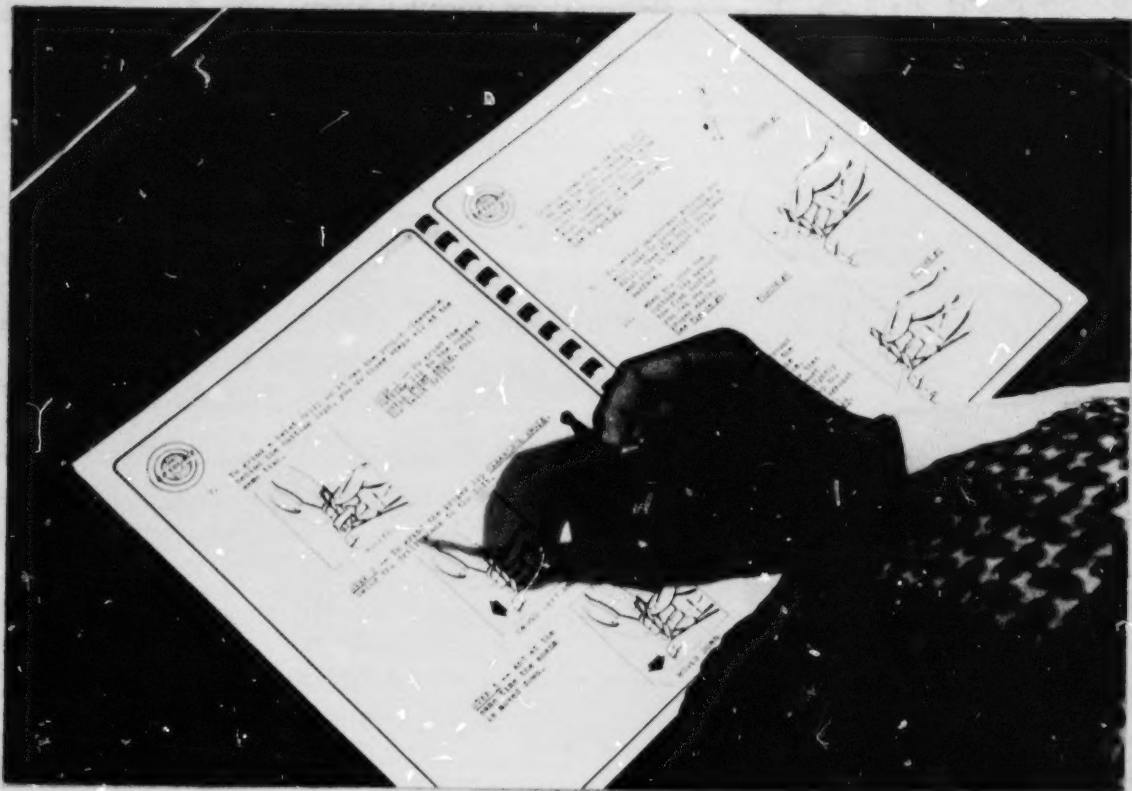


Figure 3. Resource sheets incorporate graphics to help make things clear.